were tried on a larger scale than the former, and were applied more especially to the practical purposes of building. He recommends that the cement should not be applied in two coats, the surfaces being less likely to adhere when this is done, than if the whole cement is applied at once. He succeeded in various ways, in forming cements which appeared to be the same, in all their properties, with natural cements: and he has now employed them in buildings on a scale sufficiently extensive, and in situations sufficiently exposed to the weather, to be brought to the test of experience in the course of time. Some experiments were also made by the author, with the view of forming an artificial lithographic stone, by a calcined mixture of chalk and carbonate of magnesia: but their density could not be rendered such as to answer the purpose intended.

On the whole he draws the general conclusion, that in all attempts to imitate the water cements of nature by artificial means, carbonate of lime must be the essential ingredient; next to which in point of importance are silica and alumina. The author succeeded in forming a very good cement by uniting these three ingredients. By the addition of a small proportion either of the protoxide of iron or of the oxides of lead, or of manganese, the qualities of the compound were very much improved; these latter ingredients appearing to produce a more intimate union of all of them, and a more speedy and permanent induration of the mass.

A paper was read, "On the Meteorological Observations made at the Apartments of the Royal Society, during the Years 1827, 1828, and 1829." By J. W. Lubbock, Esq. V.P. and Treasurer of the Royal Society.

The author first inquires into the annual and diurnal variations of the barometer and thermometer, for the determination of which he takes the mean of the observations in each month made at the Apartments of the Royal Society, during the years 1827, 1828, and 1829; and also that deduced from Mr. Bouvard's observations, published in the Memoirs of the French Academy of Sciences. From the table given it would appear that the annual variations are independent of the diurnal variations. A much greater number of observations than we possess at present, made frequently and at stated times each day, are requisite before any very satisfactory conclusion can be deduced as to the influence of the moon on the fluctuations of the barometer. The author, however, has attempted the inquiry, as far as the limited range of the present records will allow, by classifying all the observed heights, corresponding to a particular age of the moon, as defined by her transit taking place within a given half hour of the day; and thence deducing mean results, which are exhibited in tables.

The results afforded by the observations at Somerset House differ widely from those obtained from corresponding observations made at the Paris Observatory. According to the former, the barometer is highest at new and full moons, and lowest at the quadratures the extent of the fluctuations being 0.08 of an inch: ac-

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cording to the latter, the contrary is the case, and the extent is only 0.05 of an inch.

Lastly, the author endeavours to ascertain how far the barometer is affected by the direction of the wind, and gives in the form of tables the mean results of observations bearing upon this point. The fluctuation, he observes, due to this, is much greater than that due to any other cause. The barometer is lowest, as might be expected, when the wind is in the rainy quarters of S.W. and W.S.W. There are not yet sufficient data for any general conclusions with regard to the influence of electrical phænomena on the weather.

April 21.

SIR ASTLEY COOPER, Bart. V.P., in the Chair.

Sir Martin Archer Shee, Knt., P.R.A., was elected a Fellow of the Society.

The following Presents were received, and thanks ordered for them :—

The Utility of the Knowledge of Nature considered, with reference to the introduction of Instruction in the Physical Sciences into the general Education of Youth. By E. W. Brayley, Jun., Esq. 8vo.—*Presented by the Author.*

On the Occurrence of the Remains of Elephants, and other Quadrupeds, in the Cliffs of Frozen Mud, in Eschscholtz Bay, within Beering's Strait, and in other distant parts of the Shores of the Arctic Seas. By the Rev. W. Buckland, D.D. F.R.S. 4to.—*The Author.*

Bulletin de la Société Française de Statistique Universelle. 2me Livraison. 4to.—*The Society.*

Extrait du Bulletin de la Société Française de Statistique Universelle. Rapport de la Commission à laquelle a été renvoyé l'examen du projet de Souscription proposée par M. J. S. Buckingham pour un Voyage de Circumnavigation et de Découvertes. 4to.—*The Society.*

Journal de l'Académie de l'Industrie Agricole, Manufacturière et Commerciale. No. 1—2. 4to.—*The Academy.*

A paper was read, "On the Errors in the Course of Vessels occasioned by local attraction, with some remarks on the recent loss of His Majesty's ship Thetis." By Peter Barlow, Esq. F.R.S., &c.

The author observes that the errors arising from the deviation of the compass produced by the attraction of ships, were formerly much less considerable than at present, from the comparatively small quantity of iron existing in the vessel. The increase of this disturbing force in a modern ship of war is easily accounted for by the immense proportion of iron now employed in its construction,